

Vision 2040: Roanoke Valley Transportation

Introduction

The official long-range transportation plan for the Roanoke Valley Transportation Planning Organization (RVTPO) will be published in two stages. The first stage: titled “Vision 2040: Roanoke Valley Transportation” (this document) is a summary plan that is geared toward the average citizen. It will meet the minimum federal requirements for a regional long-range transportation plan, and stand as the RVTPO’s regional transportation plan. All urban areas within the United States are required by federal regulations to maintain and update a regional long-range transportation plan with a minimum of a 20-year planning horizon.

The second stage which is anticipated for the summer of 2017 will be titled the Constrained Long-Range Multimodal Transportation Plan 2040 - Technical Report (CLRMTTP 2040 - Technical Report) It will contain documentation of the full technical detail, data and travel demand model that federal and state stakeholders require. The CLRMTTP 2040 - Technical Report will be a major amendment to the Vision 2040: Roanoke Valley Transportation plan and go through the full public process. It will give us the opportunity to:

- Update the financially constrained list of transportation projects.
- Update, improve and refine the performance measures which is the heart of performance based planning.
- Make any corrections or changes that have been discovered between the adoption of the Vision 2040: Roanoke Valley Transportation plan (hereafter referred to as the Vision 2040 plan) and the adoption of the CLRMTTP 2040 - Technical Report.

By taking a two stage process to the regional long-range transportation plan, we essentially get two opportunities (Fall 2016 and Fall 2017) to get things right and revise anything that needs revision. This leads to a better process, better outcomes and two separate opportunities for citizen and stakeholder input.

This Vision 2040 plan is organized like the written version of a conversation that you may have with friends or neighbors about the long-term view of transportation in our region. It is organized around the following eight questions that will serve as the titles to the eight sections of this document.

1. Where are we today with transportation in the Roanoke Valley?
2. What other plans have been done related to transportation, and how has the public been involved?
3. What do these plans say to guide transportation and land use decisions going forward?
4. What are the possibilities for the future?
5. What do these possibilities mean for transportation?

6. What funding is available to our region to make necessary investments in our transportation system?
7. What projects will best meet the needs identified for today; and, as best we can tell, for the future?
8. Do these projects have any anticipated benefits or burdens from an Environmental Justice perspective?

Before getting started with the eight sections let's get some foundational material out of the way. The Vision 2040 plan is a plan for federal surface transportation funds. The most recent federal law pertaining to federal transportation funding and policy is the Fixing America's Surface Transportation Act ("FAST Act") that was signed into law on December 4, 2015. The FAST Act has several major frameworks, concepts or initiatives that apply to the Vision 2040 plan:

- The Federal Planning Factors
- Ladders of Opportunity
- Performance Measures Based Planning
- Freight Planning

Federal Planning Factors:

According to the [Metropolitan Transportation Planning Final Rule](#) (dated May 27, 2016) there are 10 Planning Factors in 23 CFR Part 450.206:

1. Support the economic vitality of the United States, the States, metropolitan areas, and nonmetropolitan areas, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety of the transportation system for motorized and non-motorized users;
3. Increase the security of the transportation system for motorized and non-motorized users;
4. Increase accessibility and mobility of people and freight;
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
6. Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight;
7. Promote efficient system management and operation;
8. Emphasize the preservation of the existing transportation system;
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
10. Enhance travel and tourism.

Ladders of Opportunity:

The following summary of the Ladders of Opportunity Concept is from the US Department of Transportation (USDOT) [website](#):

America's highways, railways, airports, ports and transit systems help drive our economy. There is a regrettable legacy of aligning and designing transportation projects that separated Americans along economic and even racial lines. At a time when our nation has so much infrastructure to repair and replace, we have a chance to do so in a much more inclusive way that will simultaneously expand economic opportunity and socioeconomic mobility throughout America. The choices we make about future transportation projects, the people they touch and places they connect, will play a role in determining how widely opportunity expands throughout America. Together, we can build a stronger and more connected nation, a healthier economy, and more vibrant communities.

This concept can be further expressed in three contexts:

- **Work** - Infrastructure investment creates jobs and paves the way for business, particularly small and disadvantaged business enterprises.
- **Connect** - A multimodal transportation system provides Americans with safe, reliable, and affordable connections to employment, education, healthcare, and other essential services.
- **Revitalize** - Transportation infrastructure can lift up neighborhoods and regions by attracting new opportunities, jobs, and housing.
(<https://www.transportation.gov/opportunity> accessed 06/08/2016).

Clearly the concept of aligning transportation planning and workforce development efforts are an important part of the ladders of opportunity concept. Sometimes what appears at first glance to be a transportation issue is actually a workforce issue and vice-versa.

Performance Based Planning:

The [Metropolitan Transportation Planning Final Rule](#) (dated May 27, 2016) greatly increases the importance of Performance-Based planning for Metropolitan Transportation Plans (MTPs) which is their terminology for long-range transportation plans such as the Vision 2040 plan. RVTPO has participated in the Virginia Department of Transportation's (VDOT's) Performance Measures Reporting System in which we have produced an RVTPO Regional Performance Measures Report annually since 2012. However, this state level performance measurement reporting system is not completely in alignment with the new [Metropolitan Transportation Planning Final Rule](#) (dated May 27, 2016) therefore a transition in performance measures and performance based planning will be needed. This Vision 2040 plan is the first step in that

transition. This document will set the stage for the RVTPO Performance Based planning to align with the new federal rule. RVTPO's performance based planning system will be enhanced and completed in the aforementioned CLRMTP 2040 - Technical Report amendment to this plan which is anticipated in the fall of 2017. In many ways performance based planning will constitute a feedback loop whereby the system is constantly updated and improved.

Freight Planning:

The FAST Act includes a renewed interest in Freight Planning at the Transportation Planning Organization and the State Levels. The idea is to ensure adequate planning support to the vital logistics and supply chain system that benefits economic competitiveness and economic development. The RVTPO has a history of including freight in our planning effort and products including a 2012 Freight Generation Study and a 2014-15 "Western Virginia Intermodal Study." In addition, a Commercial Vehicle Model was added to the recent update of RVTPO Travel Demand Model. RVTPO will continue to expand our freight planning activities over the coming years. Reliability of the logistics and supply chain is of utmost importance to many businesses who have business models that rely on low levels of inventory and timely availability of inputs.



Section 1 - Where are we today with transportation?

In many ways we are near a tipping point in transportation. Unfortunately, it is difficult to see which way the tipping point tips. The Baby Boomers have started to retire and will all retire by 2040. The Millennials, currently in their teens and early twenties, are more numerous than the Baby Boomers. Early indications are that the Millennials get their driver's licences later, drive less and prefer more compact urban environments more than recent generations. But, will this pattern hold when Millennials form families and have children. Prototypes of self

driving vehicles from Google and others have already proven feasible. But, how long will it take before most vehicles are at least partially automated? And, will this let us get enough extra capacity out of the busses and roads that we already have to not have to build so many new roads in the future? Or, is this just hope in "gee whiz" technology and reality will be similar to today? By analogy, we are in the calm before the storm. We just don't know exactly what sort of storm it will be or if it will make landfall or stay out at sea.

The purpose of the long-range plan is not to exactly predict the future exactly. That is impossible for anyone! And, if we were capable of predicting the future, we would probably be

Billionaires on an island somewhere. Instead, the purpose of the long-range plan is to anticipate plausible possibilities for the future, and to help elected officials, citizens and other

stakeholders to wisely think through the investments in transportation infrastructure that should be made to make the most of future opportunities. In a very real and tangible way, transportation is our physical connection to economic development, community development and livability.



A more down-to-earth answer of “Where we are today with transportation?” is that we have a mixed bag of bottlenecks and spot congestion. Also, we have some accessibility to jobs and activities issues. However, we don’t generally have the stark congestion and delay issues that other areas of Virginia deal

with. **Part of the goal of the long-range plan is to help guide transportation investment decisions so that we don’t get the debilitating congestion that Northern Virginia experiences.**

The Citizens Advisory Committee (CAC) provides a citizen’s perspective on the impact of transportation plans in the region and advises the TPO Policy Board on the public participation plan. At their May 23, 2014 meeting the CAC and staff, developed a vision and six goals and objectives for the Vision 2040 plan.



The vision of the RVTPO Vision 2040 plan is to communicate a clear and consistent plan for a seamless regional multimodal transportation system that is safe, cost-effective, environmentally conscious, maintainable, inclusive of all users, and conducive to the economic vitality of the community.

#	Goals/Objectives	Applicable <i>FAST Act</i> Planning Factors	Applicable Performance Measures (See Section 7)
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1	Focus on transportation connectivity gaps in access to employment and essential services and help address those gaps through multimodal transportation solutions. The concept behind this goal is labeled “Ladders of Opportunity.”	#1 Support the economic vitality, #4 Increase accessibility and mobility ..., and #6 Enhance the integration and connectivity of the transportation system ...	<ul style="list-style-type: none"> ● Annual Unlinked Passenger Trips Per Capita. ● % of Population in TAZs served by Transit. ● % of Employment in TAZs served by Transit. ● Number of Members in RIDE Solutions Program. ● Number of Bicycle Friendly Businesses.
2	Build on our strengths by investing in multimodal transportation infrastructure improvements in predefined areas where citizens already live and work and where dense increases in jobs and housing are planned. The TPO Policy Board has defined these areas as Multimodal Districts and Multimodal Centers.	#1 Support the economic vitality of the US ..., #5 Protect and enhance the environment, promote energy conservation ... consistency between local planned growth and economic development patterns ..., #8 Emphasize the preservation of the existing transportation system.	<ul style="list-style-type: none"> ● % of Population in TAZs served by Transit. ● % of Employment in TAZs served by Transit. ● # and % of Residents who Walk to Work. ● Number of Pedestrians or Bicyclists by Location. ● Number of Greenway Users by Location.
3	Invest in a seamless multimodal transportation system by developing operations management, intelligent transportation systems and similar technical and managerial best management practices to get the most out of the transportation infrastructure and assets that already exist.	#1 Support the economic vitality... by enabling competitiveness, productivity and efficiency, #2 Increase the safety ... #3 Increase the	<ul style="list-style-type: none"> ● Mean Travel Time to Work ● Annual # of Days When Ozone Levels were Above 8-Hour Standard ● Annual Unlinked Passenger Transit Trips per Capita ● Annual Passenger Miles Traveled per Capita

		<p>security ..., #7 Promote efficient system management and operation, #8 Emphasize the preservation ..., and #10 Enhance travel and tourism.</p>	<ul style="list-style-type: none"> • Truck and Rail Mode Share by Value • Truck and Rail Mode Share by Tons
4	Facilitate greater regional planning cooperation by advancing transportation projects that benefit the citizens of more than one TPO member locality, and/or that are sponsored by more than one TPO local government.	#1 Support the economic vitality of the US..., #4 Increase accessibility and mobility of people and freight ..., and #5 ... promote consistency between transportation improvements and state and local planned growth.	<ul style="list-style-type: none"> • Ratio of \$ value of RVTPO submitted SMART SCALE applications to local government submitted applications over successive SMART SCALE application cycles.
5	Continually advance towards greater levels of performance-based planning and programming by using and incorporating feedback from the RVTPO Performance Measures report toward the planning and programming of future projects. This goal describes a continually advancing and mutually supportive feedback loop in which performance measures help define and select future projects as well as annual updates to the performance measures themselves.	All planning factors are addressed by performance based planning.	<ul style="list-style-type: none"> • Percentage of financially constrained list projects in future long-range transportation plans that were generated based on trends in performance measures rather than other sources.

6	<p>Align the RVTPO Vision 2040 prioritization process, described later in this document, as much as feasible*, to the SMART SCALE project prioritization and scoring factors in the development of Vision 2040 plan financially constrained project lists. The five state project priorities that apply statewide and to the VDOT Salem District are: economic development, safety, accessibility, environmental quality and congestion management. The goal is that RVTPO priorities stand a greater chance of being included in statewide planning and programming documents due to their consistency with the state and federally mandated prioritization process (Code of Virginia §33.1-23.5:5).</p>	<p>#1 Support the economic vitality of the United States ..., #2 Increase the safety of the transportation system ..., #3 Increase the security of the transportation system ..., #5 ... promote consistency between transportation improvements and State and local planned growth and economic development patterns, #6 Enhance the integration and connectivity of the transportation system ..., #8 Emphasize the preservation of the existing transportation system, and #10 Enhance travel and tourism.</p>	<ul style="list-style-type: none"> Percentage of Vision 2040 plan constrained list projects that get recommended for funding in the SMART SCALE system over time. Target: 100% for full alignment of Vision 2040 plan, SMART SCALE and RVTPO Transportation Improvement Program (TIP).
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Section 2 - What other plans have been done related to transportation and how has the public been involved ?

The long-range transportation planning process is a continuous process with new “long-range transportation plans” being approved every five years. In a real sense we never stop working on the next long-range plan. This continuous work often manifests itself through specific plans and studies such as corridor and area studies or vision plans. These plans often have their own public involvement process that allow for continuous public involvement in the planning process

in between long-range plans. Several new and significant planning initiatives have taken place since the adoption of the last long-range transportation plan. Highlights of major public involvement successes follow:



- **Livable Roanoke Valley**

(<http://rvarc.org/livableroanoke/>) - The Livable Roanoke Valley public involvement process took place over three years during which a Livable Roanoke Valley Summary Summary Plan was produced. Livable Roanoke Valley Actively Engaged over 1,500 citizens in the Roanoke Valley during the development of the plan. Many of these citizens were engaged through a statistically significant randomized telephone survey.

- **Congestion Management Process (CMP) Plan** - The region's first ever CMP plan was produced in 2013-14. The main citizen outreach was an online congestion sentiment survey where citizens were asked where they experienced traffic congestion, where bottlenecks occur and other similar questions. Hundreds of citizens participated in these surveys.
- **Roanoke Valley Transit Vision Plan Public Involvement Process**
<http://rvarc.org/transportation/transit/>
 The region's first ever Transit Vision Plan is anticipated to be adopted by the TPO Policy Board in September 2016. The plan was guided by a steering committee made up of people representing local governments, non-profit organizations, health and business interests. An extensive public outreach process spanned three years and involved people throughout the multiple phases of the plan's development. Citizens were engaged via traditional public meetings, focus groups, online discussion forums, and public surveys administered online, on transit vehicles, and in person. In total, over 4,000 responses guided the region's vision for transit.
- **Regional Pedestrian Vision Plan Public Involvement Process**
<http://rvarc.org/transportation/bicycle-pedestrian-greenways/regional-pedestrian-vision-plan/>
 The region's first ever Pedestrian Vision Plan was adopted by the TPO Policy Board in January 2015. As part of this planning effort, over 450 citizens responded to a public survey about the importance of walking for transportation in the Roanoke Valley and where improvements to walking infrastructure are most needed. Staff participated in local events to promote the plan and solicit input, and the TPO's Transportation Technical Committee served as the plan's steering committee.

- **Bikeway Plan for the Roanoke Valley Area MPO - 2012 Update**
<http://rvarc.org/wp-content/uploads/2013/12/RVAMPO-BikewayPlan-2012Update-web.pdf>
In March 2012, the TPO Policy Board adopted an update to its 2005 Bikeway Plan. A bicycle user survey guided the plan's recommendations with over 300 people responding to the survey. The Bikeway Plan addresses on-street accommodations whereas the Greenway Plan addresses off-street bike accommodations.
- **Roanoke Valley Conceptual Greenway Plan - 2007 Update**
<http://greenways.org/wp-content/uploads/2014/12/2007greenwayplan.pdf>
In 2007, the Greenway Plan was updated from its original 1995 plan. In developing the 2007 Update, over 200 people participated in the public input meetings. Input was also sought from local government staff and elected officials as well as corporations.
- **Roanoke Centre for Industry and Technology/Blue Hills Transportation Survey Analysis Report** (February 2014)
<http://rvarc.org/wp-content/uploads/2014/11/RCIT-Blue-Hills-Survey-Analysis-Report.pdf>
A special purpose transportation survey was carried out in a major economic development park in the City of Roanoke in order to estimate potential public transit demand. A total of 528 employees responded to the survey and a demonstration transit service project (Route 31X) began operating in January 2016.
- **Bonsack Area Public Transit Survey Analysis Report** (December 2014)
<http://rvarc.org/wp-content/uploads/2016/08/Bonsack-Area-Public-Transit-Survey-Analysis-Report.pdf>
As a follow-up to the previous survey conducted for RCIT/Blue Hills, a survey of businesses further east along Route 460 in the the Bonsack/EastPark area took place to identify the need and interest of employers of transit service. Of the 28 businesses surveyed, eight in Botetourt County and 16 in Roanoke County provided input.

Section 3 - What do these plans say to guide transportation and land use decisions going forward?

The general theme that stands out from these plans is one of access to jobs and access to activities via an interconnected easy and convenient multimodal transportation system that provides many people multiple options for moving around the Roanoke Valley. There are situations in which those who are in the market for particular jobs live in a different part of the region from where employers are offering these jobs. This is often referred to as "spatial mismatch." These plans also highlight the potential for infill development and redevelopment. One approach to "spatial mismatch" is to get people from where they live to where they work which is a transportation approach. Another approach is to encourage employers to locate close to where potential employees live via redevelopment which is a community development approach. Sometimes a situation that gets labeled as a transportation issue is really a community development opportunity. In short, these regional plans encourage investment in

transportation infrastructure (pedestrian, bicycle, transit and roadway) and investment in community development, housing and economic development initiatives in areas that are already activity centers.

Going forward, the vision for the Roanoke Valley is one that generally discourages sprawl (i.e. development that is designed and built at low densities with the automobile as the only realistic means of access); infrastructure is too expensive for the public sector to continue building and maintaining in a low-density sprawling environment. Infrastructure usually has high fixed construction costs with low incremental costs for each additional individual user up to the point of congestion. For this reason it is much more efficient to spread the fixed costs out over a concentration of users, rather than a dispersed set of users.

Section 4 - What are the possibilities for the future?

We are likely at a tipping point of technological and societal change that could profoundly impact future transportation demand, infrastructure and services. The interplay between these demographic, cultural and technological trends are complex; so, there is no one simple answer for what the future holds. In order to make sense of this complexity we use scenario planning. We essentially construct four plausible futures (scenarios) and discuss the transportation possibilities that would be required if that scenario were to happen. The transportation investments and ideas that would be a good idea in the majority of scenarios can be seen as robust. Scenario planning also helps us deal with the uncertainty inherent in long range planning. Transportation projects can be compared and contrasted across a variety of possible future conditions, and the relative merits and tradeoffs can be intelligently discussed.

Planners often make the claim that big changes are on the way when we write long-range plans, and the changes don't always come to pass. This time we have three very good reasons to think that big change could be around the corner, the first two reasons have to do with transportation demand, and the other with transportation supply:

- **Baby Boomer Retirement AND Millennials (Gen Y) Entering their Prime Working Years** - The Baby Boom Generation (born 1945-64) will be in full retirement between now and 2040. As such their transportation demand is likely to change in both kind (fewer work trips) and degree (fewer trips in general). However, accessibility to destinations and timing of trips (i.e. to keep appointments or attend social activities) may be of increased importance. Millennials (born Early 80s through 2000s), who as a group are a little bigger than the Baby Boomers, will enter their prime career and family forming years between now and 2040. So, will the Millennials just “smooth out” the transportation demand changes brought on by the Baby Boomers? There are early indications that Millennial tastes and preferences for urban amenities and transportation modes are different than past generations. In some cases, Baby Boomer and Millennials may amplify transportation demand in a similar direction, rather than, cancel

each other out. It has often been observed that both young professionals and active empty nester retirees want to live downtown or in other urban settings with social activities and amenities nearby.

- **Internet Shopping** (“The Amazon Effect”) - People are increasingly comfortable with shopping online. Traditional retail will likely to continue to play a role in the foreseeable future due to the sociability and experiential aspects of retail that are hard to replicate online. Nevertheless, it is reasonable to assume that an increasing percentage, compared with current levels, of items will be purchased online from now until 2040. In traditional retail large trucks deliver thousands of items to a retail location, and individual consumers typically purchase multiple items in one shopping trip. Each online purchase potentially represents a separate package shipped through services such as UPS, Federal Express or the US Postal Service, thus increasing small package freight transportation demand.
- **Automation and Intelligent Transportation Systems** - The prospect of automated vehicles is not an all-or-nothing situation. There are as spectrum of possibilities. The various possibilities of automation are typically grouped into five levels. The National Highway Traffic Safety Administration (NHTSA) has proposed a formal classification system for the levels of vehicular automation.

Level 0	The driver completely controls the vehicle at all times
Level 1	Individual vehicle controls are automated, such as electronic stability control or automatic braking .
Level 2	At least two controls can be automated in unison, such as adaptive cruise control in combination with lane keeping .
Level 3	The driver can fully cede control of all safety-critical functions in certain conditions.
Level 4	The vehicle performs all safety-critical functions for the entire trip, with the driver not expected to control the vehicle at any time.

Source: https://en.wikipedia.org/wiki/Autonomous_car#cite_note-10

Timeframe	Technology and Market Trends	Possible Effects	Rules of Thumb for Prioritization Process
2016 to 2020	Early Adopters have “Super Cruise Control” and similar technologies.	Safety enhancements are anticipated but few traffic flow improvements are anticipated.	None – technology won’t materially increase capacity on existing facilities.
2020 to 2030	Level 2 Technologies for Majority and Level 3 Technologies for Early Majority.	Increase in capacity of existing transportation network (collector and above) by 10% due to better traffic flow and fewer accidents.	If existing facilities are forecasted within 10% of transitioning from LOS E to D then technology improvements may allow us to forgo roadway widening.
2030 to 2040	Level 3 for Majority and Level 4 “full automation” for Early Adopters.	Increase in capacity of existing transportation network by 20% due to better traffic flow and much better safety.	If existing facilities are forecasted within 20% of transitioning from LOS E to D then technology improvements may allow us to forgo roadway widening.

Section 5 - What do these possibilities mean for transportation?

The big idea is that we do not want to look naive or unimaginative to future generations for failing to have foreseen possible impacts of demographic changes, technology and automation on transportation. We do not want to be the planners who recommended building unnecessary roads because technology, enhanced public transit or demographic trends reduced traffic congestion anyway. The problem is that there is uncertainty concerning how much technology will improve mobility and reduce traffic congestion in the future.

What we do know is that citizens in the Roanoke Valley have spoken loud and clear through many public input opportunities that more and improved multimodal transportation options are greatly desired and needed. Plans such as the Roanoke Valley Transit Vision Plan, the Roanoke Valley Pedestrian Vision Plan, the 2012 Update to the Bikeway Plan for the RVAMPO,

and the 2007 Update to the Conceptual Greenway Plan for the Roanoke Valley, for example, all provide recommendations for improving the multimodal characteristics of the Roanoke Valley's transportation network, and its successful implementation will be evident in the ease with which people can transfer easily between any combination of a car, a bus, a train, walking, and biking. The same needs exist for freight and goods movement. The interconnectedness and ease of mobility between one mode of transportation with another is essential the region's evolving transportation network and growing economy.

Section 6 - What funding is available to our region to make necessary investments in our transportation system?

Things have changed since the last long-range transportation plan. We no longer have financially constrained categories such as "City of Roanoke Urban System", "Roanoke County Secondary System", "Interstate System", "Primary System," and so forth for every locality that we serve. The financial constraint is now done on a regional basis reflecting recent statewide prioritization and project selection procedures through Virginia's "System for the Management and Allocation of Resources for Transportation" which will hereafter be referred to by its acronym SMART SCALE. This is better for regional decision making and should strengthen the role of RVTPO's Vision 2040 plan over time. The Vision 2040 plan's role will also change in response to a combination of SMART SCALE and the fact that the vast majority of anticipated future funding will be used for maintenance rather than construction. This will likely mean that very few large-scale new terrain transportation projects will be built in the future. Rather, many transportation projects will be of the incremental improvement variety. This will change what it mean for a project to "be in the long-range transportation plan" and whether or not said project is listed separately or just consistent with the plan. This distinction will be further explained in the following pages.

The new financially constrained categories are as follows along with the total amount constrained from 2016 until 2040.

ROANOKE	
	Total
Administrative	\$ 88,272,296.00
District Grant Program (HB2)	\$ 91,151,524.86
High Priority Projects (HB2)	\$ 91,151,524.85
Maintenance-Localities	\$ 411,870,834.00
Maintenance-VDOT	\$ 1,698,097,653.00
Other Discretionary Construction	\$ 196,149,536.80
RSTP	\$ 79,443,881.00
RSTP-Match	\$ 20,960,436.00
State of Good Repair	\$ 133,520,967.25
TAP	\$ 6,617,752.00
FY16 CLRP TOTALS	\$ 2,817,236,405.76

Funding categories from the preceding table such as administrative, maintenance and state of good repair are not available for adding capacity or new construction. They are included in the Vision 2040 plan because federal surface transportation funds are being used and federal regulations require it. The funding categories available for additional capacity or new equipment are depicted in the table on the following page. It is especially noteworthy that this total is much smaller than the preceding total that includes both maintenance and state of good repair. In fact, maintenance alone (VDOT and Localities) makes up almost 75% of the financial constraint. This is a clear indication that lifecycle costs of transportation infrastructure are a very important consideration.

We are indeed “fixing it first” before constructing new infrastructure. Since only 25% of the funding is available for “new construction” it is likely that the days of large scale mega transportation projects in RVTPO are essentially put on hold until further notice. Many of the projects listed in the Vision 2040 plan will be the kind of smaller projects that people often describe as a “big bang for the buck.” This changes the role of the Vision 2040 plan from past long range plans. It is now much more important for the Vision 2040 plan to generate project concepts and ideas for funding sources such as RSTP, TAP and SMART SCALE, rather than merely reacting to financial decisions by VDOT and VDRPT as was the case in the past.

District Grant Program (HB2)	\$ 91,151,524.86
High Priority Projects (HB2)	\$ 91,151,524.85
Other Discretionary Construction	\$ 196,149,536.80
RSTP	\$ 79,443,881.00
RSTP-Match	\$ 20,960,436.00
TAP	\$ 6,617,752.00
Total - Construction	\$ 485,474,655.51

The amounts depicted above are sum totals from Fiscal Year 2016 through Fiscal Year 2040. The detailed yearly breakdown of the funding is included in the appendix of this document. We must take inflation into consideration in constructing our constrained list of projects. Fortunately these funding categories already account for inflation on the revenue side because each year that makes up the total is already in future dollars (Year of Expenditure Dollars - YOE) for that year. For more information about the revenue growth assumptions that lead to these funding totals please see the appendix of this document.

We have decided on a 3% annual inflation rate for project costs in consultation with VDOT using their standard assumptions for planning level project cost inflation. The 3% annual inflation for project costs is higher than the growth rate of revenue using state level revenue collection assumptions (see appendix). This means that our “purchasing power” will erode over time with respect to new transportation projects. In other words, our dollars will buy fewer projects in the out years of this long-range plan solely due to inflation.

The situation is even more striking with regards to public transit. Revenues for the maintenance and operation of existing public transit services are expected to remain flat. Therefore, inflation will take a larger toll on the purchasing power of future year transit dollars than on the transportation construction side. A one year snapshot (FY 2016) of public transit specific funding follows:

	FY 2016 ²			
	Estimated Federal Revenue	Non-Federal Revenue		Total Estimated Revenue
		Estimated State Revenue	Estimated local Revenue	
Section 5303 ³	\$ 125,542	\$ 15,693	\$ 15,693	\$ 156,928
Section 5307 ⁴	\$ 2,449,772	\$ 306,222	\$ 306,222	\$ 3,062,215
Section 5311 ⁵	\$ 694,958	\$ -	\$ 334,958	\$ 1,029,916
Section 5339 ⁴	\$ 268,621	\$ 53,724	\$ 13,431	\$ 335,776
Section 5310	\$ 221,013	\$ -	\$ 55,253	\$ 276,266
TOTAL	\$ 3,759,906	\$ 375,639	\$ 725,557	\$ 4,861,102

Summing up the fiscal years from FY 2016 through FY 2040 (25 years) gives us the following aggregate financial constraint for public transit specific funding sources (note due to rounding cents to the dollar the totals below may be slightly different than a simple calculation of FY 2016 * 25) :

FISCAL CONSTRAINT DEMONSTRATION

	Total from FY 2016 through FY 2040			
	Estimated Federal Revenue	Non-Federal Revenue		Total Estimated Revenue
		Estimated State Revenue	Estimated local Revenue	
Section 5303 ³	\$ 3,138,550	\$ 392,325	\$ 392,325	\$ 3,923,200
Section 5307 ⁴	\$ 61,244,300	\$ 7,655,538	\$ 7,655,538	\$ 76,555,375
Section 5311 ⁵	\$ 17,373,950	\$ -	\$ 8,373,950	\$ 25,747,900
Section 5339 ⁴	\$ 6,715,525	\$ 1,343,105	\$ 335,776	\$ 8,394,406
Section 5310	\$ 5,525,325	\$ -	\$ 1,381,331	\$ 6,906,656
TOTAL	\$ 93,997,650	\$ 9,390,968	\$ 18,138,920	\$ 121,527,538

Many projects associated with public transit such as bus stop improvements, accessibility improvements, transfer centers and multimodal centers can be funded through the District Grant Program, High Priority Program, RSTP, TAP and/or other construction and new project related funding sources. The 5303,07,10,11,and 39 family of funding can be reserved for service maintenance and provision purposes. Other non 53** funding can and should be used for public transit supportive projects found in the Regional Transit Vision Plan.

The financial constraint, for both public transit and transportation facility construction, functions at two levels. Some transportation projects are regionally significant and need to be listed individually in the financially constrained list of projects. Other projects such as spot improvements, adding sidewalks to existing corridors, signal timings and various similar projects

are to-be-determined based on future RSTP, TAP, District Grant Program or High Priority Program applications in future funding cycles. Each of these programs has an application and scoring process that takes place either annually or bi-annually. It would be impossible for any long-range transportation plan to anticipate the totality of all RSTP, TAP or SMART SCALE applications dealing with spot improvements, intersection improvements, traffic signal upgrades, sidewalk additions, bicycle accommodations, bus shelters or access improvements that may be applied for from now until 2040. Therefore many of these smaller, non-regionally significant, projects are financially constrained by virtue of being grouped in a financially constrained category with project selection to be determined by the RSTP, SMART SCALE, TAP or similar program's own selection and scoring procedures. There is a fine line in determining which projects are "regionally significant" for the purposes of being listed individually in the Vision 2040 plan and which are grouped into a category. The determination is both an art and science and involves the participation of Federal and State partners in the continuing, cooperative and comprehensive "3-C" process.

The key distinction is between transportation projects that fall in either Category A or Category B:

- **Category A: "specifically referenced in"** (i.e identified individually) the Vision 2040 plan; and,
- **Category B:** Projects that are "**consistent with**" the Vision 2040 plan.

Applicable projects falling into either of these categories are "in the long-range transportation plan" for 3C review process. As mentioned above, Category A projects are specifically referenced in the Vision 2040 plan. However, Category B projects applies to funding categories that have their own rating or scoring system, and that take applications on a regular basis such as RSTP, TAP, SMART SCALE District Grants, and SMART SCALE High Priority Funding. Local governments and transit agencies can apply for these funding sources individually. More specifically, Category B projects are defined as projects that:

- Are **not** the type that must be identified individually, "*i.e. specifically referenced in,*" (i.e including but not limited to: typical intersection improvements, signal timing, typical sidewalk and bikeway projects, bus shelters or other transit access enhancements, etc.), then the project should be compatible with the vision, strategies and goals of the Vision 2040 plan.

If the project is of the type that must be identified individually in the Vision 2040 plan (i.e. including but not limited to new road construction, interchange projects, fixed guideway transit projects, etc.), then the projects should be specifically referenced in the Vision 2040 plan, or amended into the Vision 2040 plan in the future, such as, during the CLRMTTP 2040 - Technical Report amendment process anticipated in 2017.

The procedure for determining whether a transportation project arising from a future RSTP, TAP or SMART SCALE application can be determined to be “consistent with” or whether it must be “specifically referenced in” the Vision 2040 plan will be as follows:

If a question about whether a given transportation project is “in the long-range plan” arises the following procedure will be used to determine the status of the project.

1. Staff will check the Vision 2040 plan to see if project is already covered by a larger financially constrained list project; and, the RSTP, TAP, SMART SCALE or other project in question is just one segment, aspect, portion or phase of the larger project. For example, a large Vision 2040 plan project on I-81 may be implemented by several separate SMART SCALE applications/projects over the years, each of which represents a smaller portion of the whole. In this case, the project will be determined to have been referenced in the Vision 2040 plan by virtue of being contained in the larger project’s scope.
2. If the first step doesn’t apply, staff will determine if the project is of the type that needs to be specifically referenced (i.e. individually listed) in the Vision 2040 plan, or if the project is of the type that can be determined to be “consistent with” the Vision 2040 plan. If a project needs to be individually listed and it is not already listed, or already covered by a larger project in the Vision 2040 plan, then an amendment to the Vision 2040 plan will need to be processed according to RVTPO’s most current Public Participation Plan (PPP). If the project can be determined to be “consistent with the Vision 2040 plan” then no amendment or individual listing is needed.
3. For projects that don’t need an amendment, a letter, or other appropriate electronic correspondence, can be requested from the Secretary to the RVTPO (currently the Executive Director of RVARC) to VDOT and/or VDRPT stating that the project is “consistent with” the Vision 2040 plan, stating the reasons for this determination and asking for concurrence from VDOT and/or VDRPT as appropriate.

Section 7 - What projects will best meet the needs identified for today; and, as best we can tell, for the future?

There are two basic frameworks to keep in mind in identifying which projects will best meet our current and future needs: 1) Project selection and prioritization; and 2) Performance Based Planning over successive long-range transportation plans.

Transportation project ideas may come from a variety of sources including but not limited to:

- The Regional Travel Demand Model (TDM);
- Other regional transportation plans including but not limited to: the Regional Transit Vision Plan, the Regional Pedestrian Vision Plan and the Congestion Management Process Plan; and,
- Local government comprehensive, neighborhood, community and strategic plans.

Notwithstanding the original source of the project idea, there are typically more candidate projects than there are funds in the financially constrained list of projects. There needs to be an initial way of selecting projects for the financially constrained list. Worthy projects that are not selected for the financially constrained list can be placed on the vision list of projects. The purpose of the vision list is to provide ready to go projects should unanticipated additional funding be made available in the future to enlarge the financially constrained list.

The initial project selection process will be based on the same six factors found in Virginia's SMART SCALE system (see: <http://vasmartscale.org/>) which are: **Safety, Congestion Mitigation, Accessibility, Environmental Quality, Economic Development and Land Use.** There are two good reasons for using these six factors:

1) The majority of the projects on the financially constrained list will be programmed through Virginia's SMART SCALE system. As such, our projects will be competing with other non-TPO projects in VDOT's Salem District for the District Grants and statewide for the High Priority Funds. Thinking through the project's relationship to the six factors will help us later when it is time to implement the projects through SMART SCALE. Please note that portions of a single larger financially constrained list project may be implemented through several SMART SCALE project applications each representing a smaller portion or phase of the larger effort.

2) These six factors allow us to discuss potential project spillovers (externalities), both positive and negative, in an intelligent manner. Many projects bring potentially positive spillover benefits such as access to jobs, facilitating economic development or providing more transportation choice that should be thought through and duly considered. For an additional framework designed to ensure that we account for any negative social or community justice spillovers from candidate transportation projects please see Section 8 of this document "Do these projects have any anticipated benefits or burdens from an Environmental Justice perspective?"

Selection of projects using the six factors will generally occur at the staff and Transportation Technical Committee (TTC) level.

RVTPO long-range transportation plans plan for at least a 20-year horizon. However, RVTPO long-range transportation plans are updated at least every 5 years with each successive plan potentially moving the 20-year planning horizon out an additional five years. As such, an initial selection of constrained list projects in any given long-range transportation plan needs to be linked to subsequent decisions in future long-range transportation plans. The best way to do this is to use performance measures in Performance Based Planning. This Vision 2040 plan will establish the initial list of performance measures and targets that will apply the the long-range transportation planning process. Future long-range transportation plans may amend or expand these measures. For instance, it is anticipated that the CLRMTP 2040 - Technical Report amendment in 2017 will significantly define performance measures and performance

based planning to a much greater extent than this Vision 2040 plan. In any case, updated progress on performance measures should inform choices in future long-range transportation plans in conjunction with the six project selection factors. Project selection will become both an art and a science in future long-range transportation plans as both progress on Performance Based Planning and the six project selection factors will be balanced together for more informed and robust choices. Like many important decisions over time, there will be a feedback loop aspect to SMART SCALE and future long-range transportation plans.

The RVTPO has been reporting performance measures annually since 2012. Annual performance measures reports can be found here: http://rvarc.org/transportation/mpo_urban_transportation/performance_measures The goal of the Vision 2040 plan and other regional plans is to propose new relevant performance measures and otherwise further advance performance based planning. This will develop a positive feedback loop with regional transportation plans and the annual performance measures reports, so that the annual reports serve to integrate and track the measures developed in the planning process. The new performance measures proposed in this Vision 2040 plan are listed in the table below.

Performance Measure	Level of Data Collection	Desired Trend	Target	Source of New Measure
Linear feet of public walkways in the TPO Study Area	By locality for TPO	Upwards	10% increase over 5 years	Regional Pedestrian Vision Plan (2015) (Proposed)
Number of ADA accessible public transit stops	By locality for TPO	Upwards	10% increase over 5 years	Regional Pedestrian Vision Plan (2015) (Proposed)
% of construction funding in the TIP that include pedestrian accommodations.	RVTPO	Upwards	20% increase over 5 years	(Proposed)
Percent change in activity density in the RVTPO urbanized area.	RVTPO	Upwards	5% increase over 5 years	Regional Transit Vision Plan (2016) (Proposed)
Percentage of vehicles in the transit fleet that do not rely on fossil fuels for propulsion.	RVTPO	Upwards	10% of the fleet in 10 years time.	Regional Transit Vision Plan (2016) (Proposed)
Number of regional and local transit connections to the Roanoke-Blacksburg Regional	By locality and TPO	Upwards	1 additional service connection	Regional Transit Vision Plan (2016) (Proposed)

Airport and intercity bus services			without additional loss of current service over next 10 years.	
Percent of new biking infrastructure built to connect transit stops with destinations within three miles	By locality for TPO	Upwards	50% of all new biking infrastructure starting in 2017.	Regional Transit Vision Plan (2016) (Proposed)
Percent of population and of employment in the RVTPO Urbanized Area within ¼ mile of transit	By locality for TPO	Upwards	10% increase over 5 years	Regional Transit Vision Plan (2016) (Proposed)
Percent of project funding in the Transportation Improvement Program (TIP) that include transit supportive infrastructure	RVTPO	Upwards	5% of TIP funding within 10 years.	Regional Transit Vision Plan (2016) (Proposed)
Percent of RVTPO Urbanized Area included in an Urban Development Area.	RVTPO	Upwards	10% increase over 5 years.	Regional Transit Vision Plan (2016) (Proposed)
Ridership/activity index at transit stops before and after transit amenities are installed	RVTPO	Upwards	10% increase in first year after amenity installation.	Regional Transit Vision Plan (2016) (Proposed)

DRAFT FINANCIALLY CONSTRAINED LIST OF PROJECTS
PROJECTS NOT IN THE SIX-YEAR IMPROVEMENT PROGRAM

Project	Locality/Agency	Cost Estimate	Generally Preferred Time Frame	Eligibility
Road/Highway/Interstate Projects				
Valley View Boulevard Extension	City of Roanoke	\$48,334,000	Short-Term	RSTP, Smart Scale
Hershberger Rd. - Cove to Peters Creek (add turn lanes, C&G, sidewalk, bike lanes, drainage)	City of Roanoke	\$6,889,400		RSTP, Smart Scale, TA
U.S. 220 Improvements from Electric Rd./Rte. 419 to Franklin County	Roanoke Co.	\$135,626,400	Medium to Long-Term	RSTP, Smart Scale
U.S. 220 NB ramp extension to through lane (over Rte. 419)	Roanoke Co.	\$3,000,000	Short-Term	RSTP, Smart Scale
F581 & Peters Creek Rd. Interchange Improvements (enhancing access to Valleypointe Dr.)	Roanoke Co.	\$4,500,000	Medium-Term	RSTP, Smart Scale
U.S. 11/Williamson Rd. (from Peters Creek Rd. to Roanoke City Limit) Urban 2 or 4-lanes & Bike/Ped Improvements	Roanoke Co.	\$24,017,000	Medium-Term	RSTP, Smart Scale, TA
Route 116/Jae Valley Rd. Improvements (rural 2-lane w/shoulder improvements)	Roanoke Co.	\$22,800,600	Medium to Long-Term	RSTP, Smart Scale
U.S. 221/Brambleton Ave. Pedestrian Improvements (Roanoke City to Electric Rd.; SRTS - various)	Roanoke Co.	\$1,092,240	Short to Medium-Term	RSTP, Smart Scale, TA
Explore Park Access - Hardy Rd./Blue Ridge Parkway Connection	Roanoke Co.	\$16,000,000		RSTP, Smart Scale, TA
Explore Park Access - Secondary Access Points from Rutrough Rd.	Roanoke Co.	\$9,902,200	Short to Medium-Term	RSTP, Smart Scale, TA
Rte. 1662/McVitty Rd. & Rte. 1663/Old Cave Spring Rd. Improvements	Roanoke Co.		Short-Term	RSTP, Smart Scale
Develop U.S. 460/Challenger Ave. to Urban 6 lanes (continuation of Roanoke City project - from Roanoke City Limits to Botetourt Co.)	Roanoke Co.	\$372,750	Medium to Long-Term	RSTP, Smart Scale
East Main Street Phase II - Brand Ave. to Kessler Mill	City of Salem	\$13,000,000	Short to Medium-Term	RSTP, Smart Scale
East Main Street/Downtown Salem Streetscape	City of Salem	\$7,000,000	Short to Medium-Term	RSTP, Smart Scale, TA
Downtown Streetscape and Intersection Improvements	City of Salem	\$300,000	Short-Term	RSTP, Smart Scale, TA
Airport Road/Route 118 Tunnel Rehabilitation	Roanoke-Blacksburg Regional Airport	\$6,425,000	Short to Medium-Term	RSTP, Smart Scale
I-81 Improvements from the Western TPO Boundary to Exit 150				
Various auxiliary lane and ramp extension projects on I-81	Botetourt Co., Montgomery Co., Roanoke Co.	\$150,000,000	Short to Medium-Term	RSTP, Smart Scale
Studies				
Colonial Avenue Improvements - Brandon Ave. to Winding Way (streetscape, C&G, sidewalk, widen 1-in., drainage)	City of Roanoke	\$5,335,400	Medium-Term	RSTP, Smart Scale, TA
U.S. 11/U.S. 460 Corridor Study	Roanoke Co.			
Bike/Pedestrian/Transit Access Projects				
King St. - Gus Nicks to Orange (add turn lanes, C&G, sidewalk, bike lanes, drainage, reconstruct signal)	City of Roanoke	\$7,513,000	Medium-Term	RSTP, Smart Scale
Melrose/Salem Turnpike/Orange (dev. Of village cts., bike/ped impr., parking, drainage)	City of Roanoke	\$1,512,000	Any Timeframe	RSTP, Smart Scale, TA
Valley View Blvd. Transit Access/Pedestrian Improvements	City of Roanoke	\$300,000	Short-Term	RSTP, Smart Scale, TA
Campbell Avenue Bike and Ped Improvements	City of Roanoke	\$3,300,000		RSTP, Smart Scale, TA
Bus Stop Accessibility	City of Roanoke / GRTC	\$1,000,000	Short to Medium-Term	RSTP, Smart Scale, TA
Real Time Information System (short-term)	GRTC	\$225,000	Short-Term	RSTP, Smart Scale
Various Bus Stop Access Improvements/Enhancements	GRTC / Various Localities	\$2,000,000	Any Timeframe	RSTP, Smart Scale, TA
Electric Road/419 & Brambleton to Postal Multimodal Improvements	Roanoke Co.	\$100,000	Short-Term	RSTP, Smart Scale, TA
West Main Street Pedestrian Improvements - Phase II	Roanoke Co.	\$909,386	Short to Medium-Term	RSTP, Smart Scale, TA
Rte. 625/Hershberger Rd. - Bicycle and Pedestrian Accommodations (Roanoke City to Plantation Rd.)	Roanoke Co.	\$534,000	Medium-Term	RSTP, Smart Scale, TA
Rte. 634/Hardy Rd. - Bicycle and Pedestrian Improvements (from Vinton to Bedford Co.)	Roanoke Co.	\$1,245,000	Medium-Term	RSTP, Smart Scale, TA
Rte. 682/Garst Mill Rd. - Bicycle and Pedestrian Improvements (from Brambleton Ave. to Grandin Rd.)	Roanoke Co.	\$1,057,000	Medium-Term	RSTP, Smart Scale, TA
Rte. 687/Penn Forest Rd. - Bicycle and Pedestrian Improvements (from Colonial Ave. to Starkey Rd.)	Roanoke Co.	\$978,000	Medium-Term	RSTP, Smart Scale, TA
Rte. 679/Buck Mountain Rd. - Bicycle and Pedestrian Improvements (from Starkey Rd. to U.S. 220)	Roanoke Co.	\$1,460,000	Medium-Term	RSTP, Smart Scale, TA
Rte. 907/Starkey Rd. Improvements (Urban 2 or 4-lane, with bike/ped accommodations)	Roanoke Co.	\$11,940,000	Medium-Term	RSTP, Smart Scale, TA
Brambleton Avenue - Transit/Bike/Ped Improvements	Roanoke Co., City of Roanoke	\$3,634,000	Medium-Term	RSTP, Smart Scale, TA
Transit Facilities Projects				
Downtown Roanoke Intermodal Station	City of Roanoke / GRTC	\$10,000,000	Short to Medium-Term	RSTP, Smart Scale, TA
Carlton Transfer Facility	City of Roanoke / GRTC	\$750,000	Short to Medium-Term	RSTP, Smart Scale, TA
Crossroads Transfer Facility	City of Roanoke / GRTC	\$750,000	Short to Medium-Term	RSTP, Smart Scale, TA
Roanoke County Transfer Facilities (various)	Roanoke Co. / GRTC	\$850,000	Short to Medium-Term	RSTP, Smart Scale, TA
Lewis Gale Transfer Facility	City of Salem	\$100,000	Short-Term	RSTP, Smart Scale, TA
Downtown Salem Transfer Facility	City of Salem	\$100,000	Short to Medium-Term	RSTP, Smart Scale, TA
VA Medical Center Transfer Facility	City of Salem	\$50,000	Short-Term	RSTP, Smart Scale, TA
Transit Vehicles Projects				
Ongoing Bus Replacement and Rebuild Program	GRTC	\$14,127,475	Any Timeframe	RSTP
Six (6) Additional Vehicles (short-term)	GRTC	\$2,790,000	Short to Medium-Term	RSTP, Smart Scale
Greenway Projects				
Mason Creek Greenway	City of Roanoke, City of Salem	\$3,000,000	Short to Medium-Term	RSTP, Smart Scale, TA
Roanoke River Greenway from Rotary Park to Roanoke City Corporate Limit	City of Salem	\$3,000,000	Short to Medium-Term	RSTP, Smart Scale, TA
Glade Creek Greenway, Phase II	Town of Vinton	\$526,210	Short-Term	RSTP, Smart Scale, TA
Glade Creek Greenway, Phase III	Town of Vinton	\$300,000	Any Timeframe	RSTP, Smart Scale, TA
Tinker Creek Trail Extension	City of Roanoke	\$1,220,000	Short-Term	RSTP, Smart Scale, TA
Lick Run Greenway	City of Roanoke	\$3,000,000	Medium-Term	RSTP, TA
Tinker Creek Greenway	Roanoke City, Roanoke Co., Botetourt Co.	\$10,000,000	Short to Medium-Term	RSTP, Smart Scale, TA
Roanoke River Greenway from Blue Ridge Parkway to Back Creek	Roanoke Co.	\$3,000,000	Short-Term	FLAP, Smart Scale, TA
Roanoke River Greenway West - Green Hill Park to Montgomery County	Roanoke Co.	\$15,333,327	Short to Medium-Term	RSTP, Smart Scale, TA
Roanoke River Greenway West - West Main Street Pedestrian Connections	Roanoke Co.		Short to Medium-Term	RSTP, Smart Scale, TA
Roanoke River Greenway Extension from Blue Ridge Parkway through Explore Park to Rutrough Rd.	Roanoke Co.	\$2,369,000	Short to Medium-Term	RSTP, Smart Scale, TA
ITS Projects				
Traffic signal improvements at Electric Road/419 & Brambleton Ave. (traffic & video control sensors, upgrade to LED lights)	Roanoke Co.	\$280,000	Short-Term	RSTP, Smart Scale
Rte. 419/Electric Rd. Adaptive Traffic Control Improvements (Springwood Park Dr. to McVitty Rd.; Carriage Ln. to Valley Dr.)	Roanoke Co.	\$400,000	Short-Term	RSTP, Smart Scale
U.S. 221/Brambleton Ave. Adaptive Traffic Control Improvements (Colonial Ave. to Ranchcrest Dr.)	Roanoke Co.	\$400,000	Short-Term	RSTP, Smart Scale
		\$600,001,158		

- Notes:**
1. Cost estimates in red were developed by staff using VDOT's Project Cost Estimating System
 2. The number assigned in "Short, Medium and Long-Term" columns are representative of votes received for each time frame.

DRAFT VISION LIST OF PROJECTS

Project	Locality/Agency	Cost Estimate	Eligibility
Road/Highway/Interstate Projects			
Cove Rd. – Hershberger to Peters Creek (add turn lanes, C&G, sidewalk, bike lanes, drainage)	City of Roanoke	\$7,511,000	RSTP, Smart Scale, TA
Church Ave. – Jefferson to 5th streetscape improvements	City of Roanoke	\$2,797,200	RSTP, Smart Scale
Williamson Rd. – Orange to Angell (road diet)	City of Roanoke	\$9,531,200	RSTP, Smart Scale
Memorial Ave. – Grandin to Denniston (streetscape impr.)	City of Roanoke	\$1,450,400	RSTP, Smart Scale
Hollins Rd. (Orange Ave. to Liberty Rd) widening to 4 lanes w/bicycle In.	City of Roanoke	\$6,106,740	RSTP, Smart Scale, TA
Jefferson St. – Elm to McClanahan (road diet)	City of Roanoke	\$12,700,800	RSTP, Smart Scale
McVitty Rd. & Old Cave Spring Rd. Improvements	Roanoke Co.	\$19,305,742	RSTP, Smart Scale
Friendship Lane/Carvins Creek Bridge Replacement	Roanoke Co.	\$136,495	RSTP, HSIP
Apperson Drive over Roanoke River Bridge Repl./Widening – Bike/Ped Accommodations	City of Salem	\$5,150,000	RSTP, Smart Scale, TA
Interchange Lighting at I-81 Exits 137-150	Salem, Roanoke Co., Botetourt Co.	\$8,410,000	RSTP
Walnut Avenue and 8 th Street Intersection	Town of Vinton	\$2,334,931	RSTP, Smart Scale, TA
Comprehensive Traffic Intersection Improvements	Town of Vinton	\$2,750,000	RSTP, Smart Scale
Bike/Pedestrian/Transit Access Projects			
9th St., SE (streetscape, pedestrian improvements, roundabouts, road diet & ped impr.)	City of Roanoke	\$7,252,000	RSTP, Smart Scale, TA
Second Pedestrian Bridge over I-581 at Valley View Blvd.	City of Roanoke	\$4,000,000	RSTP, Smart Scale, TA
Liberty Rd. - Burrell to Hollins (add turn lanes, C&G, sidewalk, bike lanes, drainage, reconstruct signal)	City of Roanoke	\$6,941,200	RSTP, Smart Scale
Future Joint Transit/Bike/Ped Improvement Projects	City of Roanoke, Roanoke Co.	\$1,855,000	RSTP, Smart Scale, TA
Apperson Drive Streetscape/Multimodal Improvements	City of Salem	\$250,000	RSTP, Smart Scale, TA
Braeburn Drive – Transit/Bike/Ped Improvements	City of Salem	\$510,000	RSTP, Smart Scale, TA
Virginia Ave./Rte. 24 bicycle improvements (from ECL City of Roanoke to Chestnut St. * (Discuss this and other bike projects at mtg.))	Town of Vinton	TBD	RSTP, Smart Scale, TA
Hardy Road SRTS Project (to include new signalized intersection)	Town of Vinton	\$250,000	RSTP, Smart Scale, TA
Transit Facilities Projects			
Valley Metro Expanded Maintenance Facility	GRTC	\$2,200,000	RSTP, Smart Scale
Transit Vehicles Projects			
Nine (9) Additional Vehicles (medium-term)	GRTC	\$5,274,000	RSTP, Smart Scale
Twenty-two (22) Additional Vehicles (long-term)	GRTC	\$14,740,000	RSTP, Smart Scale
NOTE: cost estimates in red were developed by staff using VDOT's Project Cost Estimating		\$121,456,708	

Section 8 - Do these projects have any anticipated benefits or burdens from an Environmental Justice perspective?

Environmental Justice (EJ) has a slightly misleading name. It is more of a social justice and fairness concept. It does have a connection to the physical environment through emphasizing that traditionally underrepresented communities, low-income and minority communities, should not be adversely affected by disproportionate exposure to pollution, or other adverse impacts, from transportation projects. However, the central meaning behind EJ is more about not disrupting the social fabric, cohesion and development of traditionally underrepresented communities. Disruption could occur by separating communities with large thoroughfare transportation projects that don't directly serve the communities and may serve as barriers. At its core EJ seeks to learn from the mistakes of the "Urban Renewal" era of the 1960s and 70s in which vibrant and successful urban neighborhoods were divided by freeways and highways

subsequently harming the economic health and social fabric of the neighborhoods. More information about the official history of the EJ concept with its origins in Title VI of the Civil Rights Act of 1964 and Executive Orders 12898 and 13166 in the late 90s and early 2000s can be found in the [RVTPO Title VI, Environmental Justice and Limited English Proficiency \(LEP\) Plan](#).

EJ concepts extend beyond the planning phase through the project development, engineering and construction phases. For our purposes as a federally recognized Metropolitan Planning Organization (We go by Transportation Planning Organization in our region), EJ concepts will primarily be implemented at two separate levels:

- In the long-range plan at the planning level to the financially constrained list of projects; and,
- When RVTPO implements long-range plan by applying for SMART SCALE High Priority funding (the Virginia Prioritization and Programming system) over successive application cycles. SMART SCALE is the effective link between the long-range transportation plan and the Transportation Improvement Program (TIP).

These two levels, separated in time, allow us to use a “canary in the coal mine” approach in the long-range plan. The EJ Framework will primarily identify red flags and screen out any patently inappropriate projects from the long-range plan. Later, before projects are actually applied for in SMART SCALE, we can use the framework again, in a more robust manner, to modify the scope of the SMART SCALE application to address any additional EJ concerns that arise.

In order to evaluate EJ impacts, both positive and negative, we will use our new EJ Benefits and Burdens Framework that was developed for RVTPO in the form of a Master Degree Thesis by Allison Homer at Virginia Tech. We are fortunate to have this up-to-date framework that can incorporate new tools such as the [Environmental Protection Agency's EJSCREEN](#) and go beyond these tools for a robust planning level implementation of EJ concepts.

Below, is Ms. Homer's summary of her thesis entitled *Burdens, Benefits, Perceptions, and Planning: Developing an Equitable Environmental Justice Assessment Model (EEJAM 2016) for Long-Range Transportation Planning in Roanoke, Virginia*:

In the United States, it is often the case that populations who are non-white, low-income, non-English speaking, disabled, or elderly are disproportionately burdened by our transportation systems. These populations are more likely to be displaced by highways, exposed to transportation-related air, noise, water, or land pollution, denied high-quality public transportation, suffer a drop in land values due to transportation infrastructure, and a number of other factors. These issues are called “environmental justice” or “EJ” issues. The reasons behind these trends are complicated, deeply rooted in our history and development patterns, and out of the scope of this thesis. This thesis instead focuses on the measurement of these disproportionate burdens and benefits. It is a federal requirement for transportation

planners to consider environmental justice, but there is little guidance on how exactly to do this. Without this guidance, planners resort to ineffective assessments or mere “checking of boxes.” Many academic theorists have created models to measure individual effects such as air quality or water quality, but few have combined those models to create an easy-to-use “toolkit” for planners to use in assessing a full range of environmental justice effects. This thesis presents EEJAM 2016, an environmental justice assessment toolkit designed for Roanoke, VA that attempts to meet the needs of EJ populations, transportation planners, and state and federal enforcement agencies. This toolkit was created based on a literature review of environmental justice theories and models, federal and state requirements, and decision theory, analysis of former Roanoke EJ assessments, GIS and statistical analyses of the Roanoke area, and engagement of EJ advocates and stakeholders.

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Appendix